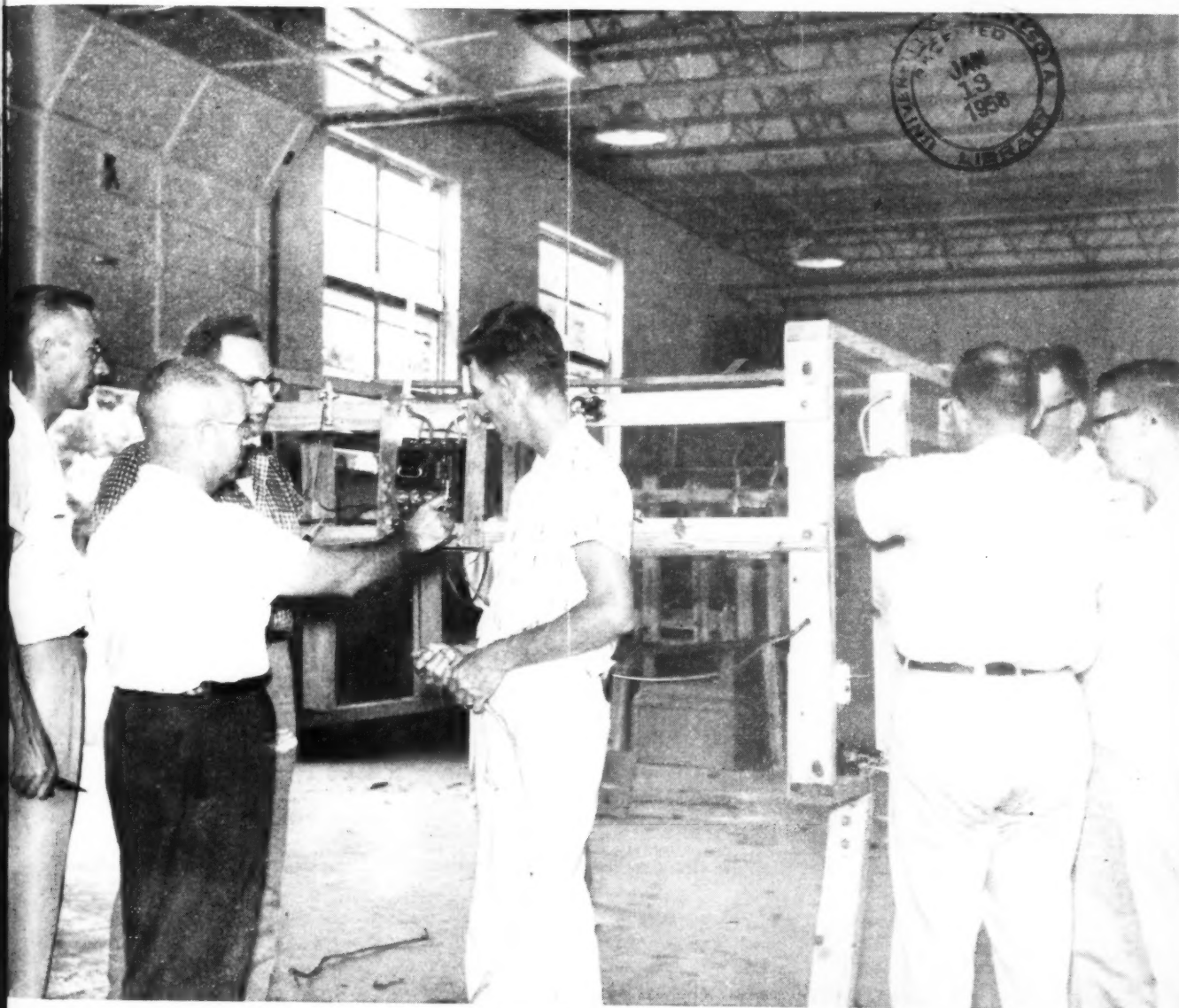


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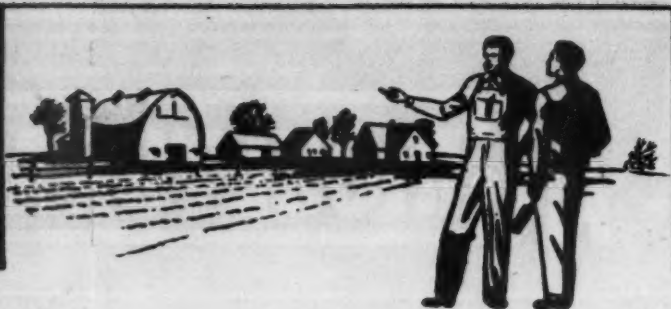
NUMBER 7



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*Featuring—* Improving Instruction in  
Farm Mechanics

# The Agricultural Education Magazine



A monthly magazine for teachers of agriculture. Managed by an editorial board chosen by the Agricultural Section of the American Vocational Association and published at cost by Interstate Printers and Publishers, Danville, Illinois.

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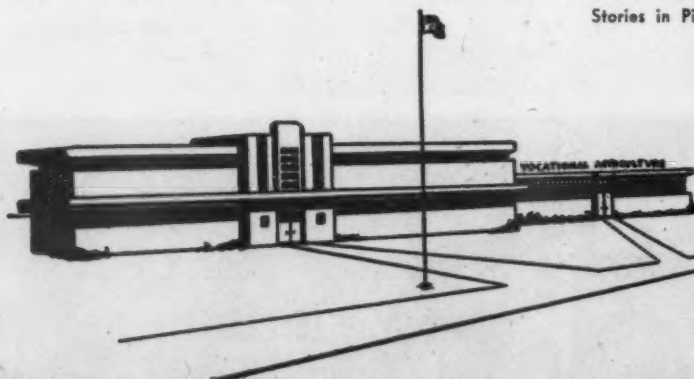
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## Editorials

### Farm Mechanics Today For Today's Young Farmers

C. O. JACOBS, Agricultural Engineering Dept.,  
Kansas State College

The teacher of vocational agriculture offering instruction to young farmers is faced with the challenge of offering systematic instruction in the mechanical phases of farming for which there is need. To meet this challenge, it is important that the teacher establish through his own inquiry and foresight objectives which will assist young farmers to comprehend more fully (and thus anticipate) farm mechanics needs in the operation of their farm businesses. However, as teachers we must ask ourselves what objectives should be established for instruction in the area of mechanical phases of farming. It is imperative that we have in mind a clear answer for the immediate and projected needs of young farmers.

Are the objectives which we have established for instruction in farm mechanics for all-day groups necessarily the objectives which are needed or even desired by young farmers? Do we have some established educational goal in mind which will be reached by a teaching plan that is definite yet flexible enough to allow variations to meet individual needs?

Too often farm mechanics instruction for young farmers has been in reality a continuation of the all-day program with emphasis on manipulative skills. There will always be a particular need for this type instruction as new skills are needed to meet changing techniques. It is also important that we recognize that we cannot justify instruction in farm mechanics for young and adult farmers unless it is taught as an integral part of agriculture. The situation which young farmers face with regard to actual need is likely not so much manual skills instruction, such as being able to cut threads or sharpen tools, as it is for knowledge about such specific items as fertilizer placement equipment, machine adjustments for proper depth of cultivation, or power take-off and hitch relationships which will appreciably affect monetary returns of farming operations.

The problem of determining the educational objectives of the mechanical phases of farming instruction for young farmer groups is of paramount importance, since approximately 80 per cent of the manual farm labor has been replaced by mechanized operations. And it is probable that wage rates for farm labor will continue to rise more proportionately than farm machinery and equipment prices and continue the trend to make it profitable to use more and

### From the Editor's Desk . . .

#### Improving instruction in farm mechanics . . .

The greatest strides toward an improved instructional program in farm mechanics can be made *before* the students enter the farm shop. It is in the classroom that the teacher lays the foundation for a successful and worthwhile shop experience.

Helping the students make good plans for their shop projects or activities; helping students learn all they must know about the materials, tools, and skills needed for making the project or carrying out the activity; and developing an orderly and systematic plan for providing needed demonstrations are only examples of what *must* be done *before* work in the shop is begun. Incorrect tool use, failure to observe elementary safety rules, poor shop behavior during the class and during clean-up, and boys standing around with nothing to do can all be traced in part to failures in classroom instruction. Teachers with large classes cannot hope to adequately supervise, and provide individual instruction for, a shop class for which little prior planning and preparation has been made—by either the students or the teacher.

#### Daily meetings in the classroom help . . .

Many teachers could solve their shop management problems by having a short meeting in the classroom *each day* prior to beginning work in the shop. These meetings can be used to make certain that each student has work planned for the day and that he knows how to proceed, to arrange for demonstrations, and to comment briefly on things that happened in the shop the day before such as violations of safety rules or incorrect tool usage. This time can also be used to get group suggestions concerning special problems that some boy is facing or to point out a novel solution to a tough problem.

#### When student and teacher are ready

The student is not ready to enter the shop until he has plans for what he wants to do and enough "know-how" to go ahead on his own until the teacher can "get to him" during the class period.

The teacher can not afford to let the class enter the shop until he knows what each student plans to do and that each student is well enough equipped with knowledge and skills to be able to proceed with the amount of help the teacher will be able to provide. □

**Best Wishes for a Happy and Fruitful  
New Year!**

The Magazine Staff



# Influence of High School Vocational Agriculture on Farm Mechanics Practices Used by Students Prior to Enrolling at Iowa State College

PAUL NELSON STEVENSON, Agricultural Engineering, Iowa State College



Paul N. Stevenson

THE purpose of this study was to determine the influence of high school vocational agriculture on the extent to which selected farm mechanics jobs or skills had been performed by graduates, prior to enrolling in Iowa State College.

## Procedure

A farm mechanics schedule was developed which included information about 75 selected common jobs or skills in the five major areas of farm mechanics; farm shop, farm buildings and conveniences, farm power and machinery, farm electrification, and soil and water management. A list of 46 commonly used tools and items of equipment was also included. This schedule was administered to 371 students enrolled at Iowa State College in A. E. 254, an introductory farm mechanics course, during the academic year of 1955-1956.

Only those graduates who could meet the qualifications outlined below were included in the sample.

1. Graduate must have lived on a farm for three or more years after he was 14 years of age.
2. Graduate must have been classified as a freshman or sophomore

more at Iowa State College.

3. Graduate must have entered college within five years after graduation from high school.
4. Graduate must not have had over three years of military service.
5. Graduate must not have had more than four months training related to farm mechanics other than in vocational agriculture or industrial arts.
6. Graduate must have been graduated from a high school in the United States.
7. The graduate in the vocational agriculture group must have completed three or more years of vocational agriculture while in high school.

In order to make comparisons, the qualifying graduates were grouped according to whether they had or did not have vocational agriculture training in high school. A table of random numbers was used to select the sample of 100 graduates who had had vocational agriculture and 100 graduates who had not received such training.

## Findings

It was found that a similar number of vocational agriculture graduates and non-vocational agriculture graduates were sons of parents who were landowners. Likewise, equal numbers of the two groups were living on farms of 240 acres or less. Sixty-nine

non-vocational agriculture graduates had shops on their home farms, whereas only 59 of the vocational agriculture graduates had shops. Equal numbers (13) of the two groups of graduates had heated shops of sufficient size to accommodate a tractor or an automobile. Thirty-six members of the vocational agriculture group indicated a "high" mechanical interest, as compared to 45 members of the non-vocational agriculture group.

Mean scores were computed for the responses of the graduates for: (1) shops in which tools and equipment were used, (2) farm mechanics jobs done or hired done, and (3) shops in which farm mechanics jobs were learned. Vocational agriculture graduates had higher mean scores than non-vocational agriculture graduates in all of the farm mechanics areas of the three categories listed except for the shops in which farm power and machinery jobs were learned.

Chi-square analysis revealed a significant difference approaching the 1 per cent level in the responses of the vocational agriculture and non-vocational agriculture graduates regarding farm mechanics jobs done or hired done. When classified on the basis of the shops in which farm mechanics jobs were learned, chi-square analysis was highly significant at the 1 per cent level.

More than twice the mean number

(Continued on page 149)



A cattle feed bunk being constructed in the vocational agriculture shop at Sumner, Iowa. (Photo, courtesy, Forrest Bear, Vo-Ag instructor.)



These boys are repairing a harrow as a part of a machinery improvement program. (Photo, courtesy, Forrest Bear, Vo-Ag instructor, Sumner, Iowa.)

## Influence of High - - -

(Continued from page 148)

of welding tools were used by vocational agriculture graduates as were used by non-vocational agriculture graduates. Sixty-two vocational agriculture graduates used six or more farm mechanics tools, as compared to 36 non-vocational agriculture graduates who used this number.

The members of the vocational agriculture groups did on an average 36 per cent of the possible 75 farm mechanics jobs that were listed, whereas the members of the non-vocational agriculture group completed only 26 per cent of the 75 possible jobs listed. A greater proportionate number of the members of the non-vocational agriculture group hired their farm mechanics jobs done than did the members of the vocational agriculture group. Welding jobs were hired done by only 8 per cent of the vocational agriculture graduates, whereas 44 per cent of the non-vocational agriculture graduates hired their welding jobs done. Members of the two groups of graduates hired a greater percentage of their oxy-acetylene welding jobs done than their arc welding jobs.

Vocational agriculture graduates did on an average 6 per cent more of the 75 possible farm mechanics jobs than did the non-vocational agriculture graduates. The members of the vocational agriculture group learned on an average of over seven times as many farm mechanics jobs in the vocational agriculture and combined shops as compared to the average number of such jobs learned by members of the non-vocational agriculture group in the industrial arts and combined shops.

The vocational agriculture graduates learned on an average of 5.42 welding jobs as compared to an average of 2.06 such jobs learned by non-vocational agriculture graduates. Three-fifths more arc welding jobs than oxy-acetylene welding jobs were learned in the vocational agriculture shop. Almost five times as many vocational agriculture graduates learned to lay out and cut a rafter than non-vocational agriculture graduates. It may be assumed that members of the vocational agriculture group learned fewer jobs in the home and other shops because of the availability of such training in the vocational agriculture shops.

A definite relationship was found between the number of farm mechanics jobs done by the graduates and the ownership status of their parents. Those graduates whose parents were owners or part owners completed the most farm mechanics jobs. Eighty-six per cent of the 79 vocational agriculture graduates whose parents owned or partly owned their farms completed 16 or more farm mechanics jobs. Of the 81 non-vocational agriculture graduates with parents of similar ownership status, 67 per cent completed 16 or more jobs.

The percentage of graduates in the two groups whose parents' farms were 321 acres or larger, and who did 16 or more farm mechanics jobs, was approximately 16 per cent greater than the percentage of graduates completing this number of jobs whose parents' farms were 320 acres or less. It appears that considerable relationship existed between the size of the parents' farm and the number of farm mechanics jobs done.

All of the 16 vocational agriculture graduates who had heated shops completed 16 or more farm mechanics jobs. Only 87 per cent of the 43 graduates in this group who did not have heated shops completed this number of jobs.

Of the 36 vocational agriculture graduates who indicated a "high" mechanical interest, 47 per cent completed 16 or more farm mechanics jobs. This was more than twice the percentage of non-vocational agriculture graduates who had indicated a "high" mechanical interest, and had completed 16 farm mechanics jobs. Fewer vocational agriculture than non-vocational agriculture graduates indicated a "high" mechanical interest. The latter group may have indicated a "high" curiosity for such activities rather than an actual interest in mechanical work.

High school graduates who had had four years of farm mechanics in vocational agriculture averaged more jobs done per member than those who had had only three years or less of vocational agriculture farm mechanics. However, graduates who had had only one year of farm mechanics, during their eleventh or twelfth year in high school, averaged about three more jobs done per graduate than those graduates who had had farm mechanics in vocational agriculture for two or three years.

The high school graduates who had

spent two-fifths or more of their vocational agriculture class time in farm mechanics completed 28 per cent more welding jobs than was done by those who had spent one-fifth or less of their class time in shop work. In the carpentry and hot and cold metal areas, as the amount of vocational agriculture class time spent in farm mechanics increased, the average percentage of the possible jobs done decreased. This may be explained by the fact that, as more time was spent in the farm mechanics shop, larger projects, which required more time, may have been constructed.

The type of activity or job and the scope of the job may be influenced by the amount of vocational agriculture class time allowed for farm mechanics. This study did not consider the differences in the scope of the various jobs. This may account for the fact that the group of graduates who spent one-fifth or less of their vocational agriculture class time in the farm mechanics shop completed more jobs than did those graduates who had spent two-fifths or more of their class time in farm mechanics.

It is possible that a large number of elementary farm mechanics jobs were done by the graduates in classes in which one-fifth or less of the time was spent in farm mechanics, whereas the graduates who had spent two-fifths or more of their time in mechanics work completed a smaller number of jobs but the jobs were larger in scope and more complex. □

## The Cover Picture

Clarence Rogers, Assistant Professor of Agricultural Engineering, University of Florida, giving instruction on how to install an entrance switch, at one of a series of electrical clinics for vocational agriculture teachers. Group to the right is installing receptacle. Pictured left to right: J. W. Brown, Sneads; Rogers; Hugh Semmes, Wewahatchka; Howard Moore, Grand Ridge; James McCall and Grinelle Bishop, Quincy; and J. W. Gordon, Malone, all vocational agriculture teachers. □

The consumption of margarine increased from 230 million pounds in 1931 to more than 1.2 billion in 1952. During the same period, butter consumption declined from 2.2 billion pounds to 1.4 billion, notes a recent study of the Twentieth Century Fund.

Planning is the key to . . .

## Improving Instruction in Farm Mechanics

GUY E. CAIN, Assistant State Supervisor  
Vocational Agriculture, Charleston, W. Va.



Guy E. Cain

**I**NSTRUCTION in farm mechanics has been with us since 1917 when the Smith-Hughes Act was passed by Congress. Many changes have taken place in the field of Agriculture since

that time. We have seen the passing of the horse and the steady increase in the use of tractors on farms. Great strides have taken place in the mechanization of Agriculture.

How has the Vocational Agriculture farm mechanics program kept pace with this change? Too many teachers still think of the farm mechanics program in terms of carpentry, concrete work, forge work and hot and cold metal work which has an industrialized aspect. The manipulative skills taught in farm mechanics may or may not be useful in agriculture as we know it today. Much of the instruction in farm mechanics today would be termed industrial arts.

### Areas of Instruction

Anyone interested in agriculture is concerned with poultry production, dairy production, meat animals or crop

production. Farm mechanics is a definite integral part of each of these enterprises. The five areas of training in farming mechanics as recognized today are: 1. Farm Shop Work; 2. Farm Power and Machinery; 3. Rural Electrification; 4. Farm Buildings, and 5. Soil and Water Management.

The instruction in the farm building area will include some new construction but will consist mostly of maintenance. Most farmers will build or have built only one or two major farm buildings in a lifetime, but will have continuous maintenance work on existing farm buildings. There are many maintenance jobs such as repairing roofs, painting farm buildings, repairing doors and windows, repairing foundations, building feeding stanchions, and installing or repairing watering devices. All this instruction should be demonstrated and followed by laboratory work. This gives an example of what can be done in one area of farm mechanics.

### Determining Needs

The Vocational Agriculture teacher, before he can develop a course of



View of tool room at Green Bank Vo-Ag Department, Green Bank, West Virginia.

instruction in agricultural science or farm mechanics, needs to survey the students for such information as size of farm, number and kind of livestock, acreage of crops, kinds of farm machinery and condition, and farm buildings and their condition. Next the teacher will need to list the agricultural science jobs to be taught to each class by months and the time allotted to each job. Then a list should be made of all farm mechanics jobs related to these agricultural science jobs by months and, finally, these farm mechanics jobs should be identified by areas.

### Planning the Program

The following is an example of one teacher's course of study for the month of January for his Vo-Ag 1 Class:

This form is being used in West Virginia at the present time. It consists of one page, 8 1/2 by 11 inches, on both sides for each month. The

(Continued on page 152)



Vo-Ag farm mechanics class at Keyser High School, Keyser, West Virginia. Oscar Gustafson, Vo-Ag teacher is shown in left center.



Vo-Ag students in Shady Springs High School at Beaver, West Virginia, working on farm trailer in foreground and portable hog house in background. The teacher (right) is J. Robinson.





Joint planning by the teacher of vocational agriculture and the individual or group is essential for effective teaching-learning. (Photo by Coggin)



Teaching opportunities in the area of farm mechanics are unlimited. They range all the way from a simple repair job, as indicated in the above picture, to decisions as to whether to purchase a costly piece of farm power machinery. (Photo by Coggin)

## Pre-Planning a Program of Instruction in Farm Mechanics

### A method for discovering teaching opportunities

J. K. COGGIN, North Carolina State College, Raleigh.



J. K. Coggin

**M**OST of our efforts in life are expended in an attempt to solve problems. Farm mechanics problems exist in only two places—with the individual and in the farm environment where he works

and lives.

How shall we discover and identify the individual's most important problems in this area relative to his and his farm needs? What is the individual's greatest "leakage" in his farming program in the area of farm mechanics? Which one or ones, if solved, will aid him most in reaching his objective? Who makes the decision as to what is important or worthwhile?

It is assumed that the objective of the teacher of vocational agriculture is to provide those learning experiences in mechanics which will enable his students to solve the farm problems and do the jobs that they agree as most important for them to do. It is also assumed that joint planning by the teacher and student is essential for a successful program.

Discovering and selecting these most important problems and planning

instruction for effective learning experiences to solve these problems is a constant challenge to any alert teacher. The following outline in chart form indicates a method for discovering teaching opportunities and determining what to teach in the area of farm mechanics. The more information students and teachers secure by this process, the better position

(Continued on page 152)

#### Discovering Teaching Opportunities

- 1. Of individuals to be taught:
  - a. Farm equipment needs and selection
  - b. Standards of equipment servicing
  - c. Equipment repair and maintenance
  - d. Equipment construction
  - e. Skills, etc., needed to do (a-d) above
  - f. New skills to be learned in (e)

*plus*

- 2. Of existing community farm mechanics problems and trends:
  - a. Types of farming
  - b. Types equipment used and needed
  - c. Major maintenance problems
  - d. Important repairs needed
  - e. Construction needed
  - f. Skills, etc., involved (specific areas)

*plus*

- 3. Opinions of successful farmers, advisory committee, farm supply people, etc.
  - a. Major maintenance jobs that can be performed by:
    - (1) In-school groups
    - (2) Young and adult farmer groups
    - (3) Implement dealers and other service companies
  - b. Etc.

→ Final Decision Made By *Instructor and Individuals in Group*

WHAT  
TO  
TEACH

Study  
Situation

## Pre-Planning

(Continued from page 151)

they should be in to make wise decisions about *what to teach* and *what to learn* in farm mechanics.

You say, "this is theory." So it is. However, theory is the guiding light that gives a sense of direction to practice. Information, understanding and specific practice must pull together to develop required ability. Planning is an important part



Successful farmers have valuable opinions and contributions to offer the alert teacher in planning a program in farm mechanics. (Photo by Coggin)

of teaching-learning. There is no short easy way in farm mechanics or in any other area. I'm sorry. □

## Improving Instruction - - -

(Continued from page 150)

Vo-Ag 1 and Vo-Ag 2 course of instruction is on the front side with Vo-Ag 3 and Vo-Ag 4 on the back. Therefore, each teacher would have nine pages in his course of study.

In each area of farm mechanics, with the possible exception of farm

shop work, organized instruction should be given. This means that all the class will be doing similar jobs at the same time which will provide an opportunity for students to receive instruction on the job, be given demonstrations, do laboratory work, and have class discussion before going on to the next job. □

### Farm Mechanics

Area of Training	Jobs to be Taught and/or Projects For Construction and Repair	No. Hours Planned	No. Hours Taught
Farm Buildings	Constructing, Repairing or Remodeling Brooder House		
Farm Shop	Providing Equipment for Baby Chicks Platforms for Waterers Electric Brooders		
Farm Shop	Lambing Pens		
Farm Shop	Lamb Brooders		
Farm Shop	Waterers		
Total		22	

### MARLINTON HIGH SCHOOL Department of Vocational Agriculture Teaching Calendar for the Month of January Vo-Ag 1

Enterprises	Jobs to Be Taught	No. Hours Planned	No. Hours Taught
Baby Chicks	Selecting and Procuring Baby Chicks	4	
Sheep	Care of Ewes at Lambing Time	6	
Record Book	Keeping Records	2	
Total		12	

## Farm Mechanics - - -

(Continued from page 147)

more machinery on the farm. It is significant that, according to Kansas Agricultural Experiment Station Agricultural Economics Report #68, for most areas of Kansas cost of machine operation has averaged one-third of the total farm expense. Because depreciation and operating costs determine the major expenses involved in machine operation, assisting young farmers to evaluate their machinery management problems should be one phase of our objectives. It should also be emphasized that the state of machine adjustment and repair determines whether or not the young farmer will obtain the maximum return from his investment and production efforts.

Certainly our educational objectives for the young farmer must consider the fact that the small farmer, too, has a real future as a part-time farmer. By being able to adapt sooner to changing conditions and specialized production there will be a demand for agricultural education in the form of young or adult farmer classes for this group. Will the part-time farmer rely on commercial help for his machinery maintenance and mechanical repairs or will organized instruction and facilities of the school farm shop be an invaluable combination in assisting him with his maintenance problems?

It is predicted that rural America will be comprised predominantly of commercial families, not large-scale type farms. Reports indicate that the gains associated with size of farm unit in most types of farming increase most rapidly up to a two-man unit. Efficiency in utilizing labor and machinery is therefore an important factor in determining the self-sufficiency of the family-size farm. A well integrated program of instruction will be required in order to show a young farmer how mechanical operations might increase his return per hour of labor in hog production or other livestock production operations as compared to that obtained by the completely mechanized wheat producer.

Definite educational objectives are needed as guiding principles if a sound course of study including instruction in the mechanical phase of farming for young farmers is to be developed by teachers. The educational objectives developed for the

(Continued on page 156)



# Wall Panels Solve Tool Shortage Problem

This idea may work for you - -

RALPH WHITEHEAD, Vo-Ag Instructor,  
Ovid Central School, New York



Ralph Whitehead

WITH the large number of small tools needed to do an efficient job in the farm shop, tool storage in many instances presents a real problem.

A good tool storage system should meet the following requirements: (1) it should require a minimum of floor space, (2) the tools should be readily accessible to all who use them, and (3) missing tools must be easily detected.

Two years ago, I converted all my tool storage facilities to wall panels. The results have been satisfactory beyond all expectations. About 36 square feet of floor space has been gained, and at present building costs, this factor alone would more than justify the expense.

## Constructing the Panel

Two 24' panels were constructed on each side of the shop. These, with three small panels for special tools near the work centers, serve my needs very well. A valance was built across the top of the panels with strip

fluorescent lighting running the entire distance. One panel is used for machinery repair and metal working tools, the other for wood-working items. With an outline painted back of each tool, it is easy to determine if one is missing. Pupils can easily locate any needed tool, and the outline shows them where to put it back.

The necessary wall space need not be a problem. The tool panel can be extended across the lower portion of windows as shop ceilings are usually high and plenty of light will still be admitted. If you cover a window where the glass must be replaced from the inside, make some provision for removing the panel if it should become necessary.

Thirty inches from the floor is a good height to start the panel. Panels should be 4' high and as long as needed. To start, I first framed around the area with 2x4's laid on their side. These were fastened to the wall with expansion shields. Next, perpendicular 2x4's were spaced for 8' centers. Following this, I sheeted up the area



Preparing the tool silhouette. — The student is tracing around the outline of a framing square. Outline on the right has had the masking tape removed and is ready for painting.

with a cheap grade of lumber. This lumber gives rigidity and something to which to fasten the hooks and tool clips. Used lumber is satisfactory. For the finished surface, tempered hard-board is used. A trim is used around the panel and to separate the various tool areas. For this purpose strips of 1-3/8" lattice are excellent. This material is painted yellow, the same color as the tool silhouettes.

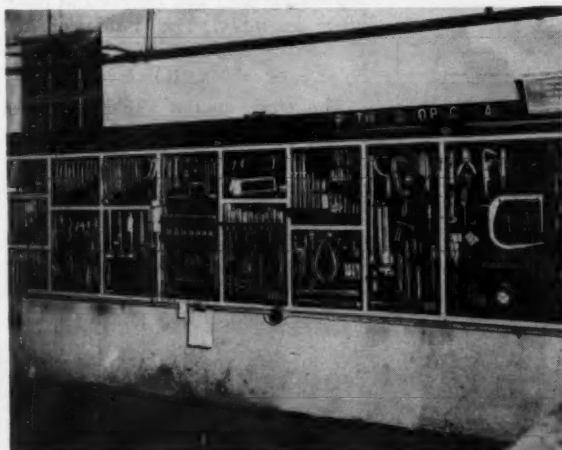
## Proper Color of Paint Important

In order to get good visibility, I painted the entire surface of the hard-board with flat black paint. For the tool outlines, implement yellow gives excellent contrast. If for some reason it is not possible to fasten the panel to the walls, it can be built free-standing and placed against the wall.

## Planning Tool Arrangement

The next step is to plan the tool arrangement. All tools used for a

(Continued on page 154)



Portion of machinery repair section of tool panel. The panel is 4' high and 24' long. The photograph was taken from an angle to avoid reflection. This makes it appear as if the silhouettes were not lined up back of the tool.



Section of tool panel for woodworking, plumbing, and sheet metal tools. Lattice 1 3/8" wide is used as a trim around the panel and to separate the tool sections. Fluorescent strip lighting runs across the top of the tool panel.

## Wall Panels - - -

(Continued from page 153)

similar purpose are grouped together. For example, woodworking measuring tools would form one area. Laying the entire plan out on paper before starting the job is very important. If your group of tools is not complete be sure to leave space for tools that will be added later. Place masking tape on the tool panel to cover an area slightly larger than the tool. Some masking tape 1½" wide will prove very useful. A narrower width can be used, but it is not as convenient. For uniformity I started my largest tool of the group on the left of each section. This is very desirable when you get to such tools as sockets and other wrenches. If a square was the first tool to be mounted, it would be held over the masking tape background and its outline traced with a pencil. I do not consider that the space saved by storing one tool, such as a square, over the other would justify the trouble of checking to see if they are all there. I would recommend a separate outline for each tool. A few tools, such as a blowtorch, will require a pattern to be cut out to trace on the masking tape. The next step is to take a sharp angle bladed knife, such as comes in a wood carving set, or a wallboard knife and cut through the masking tape where the pencil outline has been made. The tape on the inside of the line is now removed, and the area is ready for the yellow enamel. As the area to be painted is completely masked,

it takes no skill to paint the outline. With a little experience the whole job can be done quite rapidly. The remaining masking tape around the tool is removed after a good finish on the silhouette has been built up. Upon removal of the tape (after three coats of enamel) there will be a neat, sharp, yellow outline of the tool.

I have described the process for one tool. Of course, to do the job efficiently, each step would be carried through the entire panel before starting the next part of the work. Some readers may be wondering why I recommended sheeting the panel with low grade lumber and covering with hardboard rather than using thick plywood. My first panels were built with plywood. I found that in cutting the outline through the masking tape that the plywood was slightly scored. This caused small splinters of wood to be removed when the masking tape was pulled off.

### Fastening Tools to the Panel

After a group of tools was finished, I ran a lattice slat along the edge before starting the next area. As to how the tools should be fastened to the panel, I will merely say to use your ingenuity. For many, "L" hooks work very well; others are best held by spring tool clips; some will need small shelves; wood auger bits require a block with holes bored partly through. A few tools will require special wood or metal brackets. After the entire panel is completed, give it a coat of durable clear varnish.

This gives it an easy to clean, glossy finish. I believe that flat black paint is a little easier to work with and by the use of this clear finish the result is the same as if black enamel had been used.

### Materials Needed

The following bill of materials will construct a 4'x24' tool panel.

#### Tool panel

96 sq. ft. pressed hardboard	\$11.52
100', 1½" lattice	4.00
96 bd. ft. cedar boards	17.28
1 qt., flat black enamel	2.00
1 qt., yellow implement enamel	2.00
Hooks and tool clips	5.00
Masking tape	5.00
Screws and nails	.50
68', 2x4's for framing	6.80
Lag shields	3.00
<b>Material cost for panel</b>	<b>\$57.00</b>

#### Lighting valance

50 sq. ft., ¾" plywood	\$12.50
Five fluorescent lights, 4' long	35.00
Aluminum paint, 1 pt.	1.00
<b>Material cost for valance &amp; lights</b>	<b>\$48.00</b>

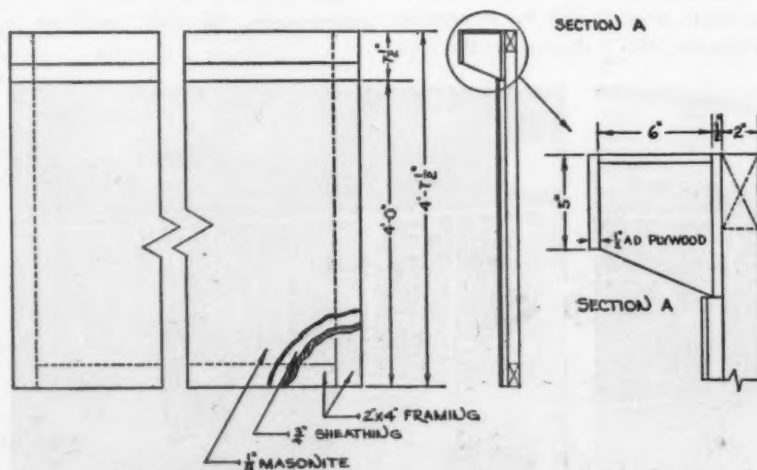
This would make the cost for material to build the panel \$2.34 per foot of length. The fluorescent lighting is not necessary, but it does make the panel very attractive and the yellow tool silhouettes much more conspicuous. If this is desired, it would increase the cost to \$4.40 per foot of length. I consider the lighting to be well worth the added expense. If the valances are to be constructed, do not forget to extend the vertical members of the 2x4 framing the required distance above the tool panel. This makes an easy way to fasten the valances to the wall. These can be constructed much easier as a separate project and fastened in place after assembly. The inside of the valances are painted with a reflective color paint; the outside is black.

The work on the tool panels was done by the pupils and myself at odd times. I now feel that I could construct, outline, paint, and hang tools for one of these 24' tool panels in the equivalent of two days. The panels can be started on a small scale, say an 8' section, and other sections added as time and funds permit.

### Idea Tested Through Use

Use and experience are the test for any idea. After two years of use, I consider these panels as one of the most useful things I have done in the ten years at the school. After several

(Continued on page 161)



ILLUMINATED WALL TOOL PANEL

Showing front view and cross section details. The 2x4 framing is laid on its side. To keep the drawing simple, the lattice strips used for trim are not shown. Nearly all nails and screws can be concealed under this strip. Perpendicular 2x4's are extended 7½" above the tool panel every 8' to give support for the valance.

Community resources used for - - -

## Tractor Maintenance Training At Quincy High School

KEITH KIRKBRIDE, Vo-Ag Instructor  
and

MEL LINDBLOOM, Principal, Quincy, Washington



Keith Kirkbride

TRACTOR maintenance training at Quincy High School is one part of the farm mechanics program. To make farm mechanics a meaningful experience in vocational agriculture class, it is necessary to provide some way to make a practical application of the theory learned. Oftentimes farm machinery or parts of farm equipment can be brought into the shop where the boys can gain experience in working with the machinery. However, tractor training in the school shop is somewhat different as most farmers prefer to have tractors worked on by skilled mechanics. With this problem in mind, it was necessary to provide a way to give the senior vocational agriculture class tractor maintenance training in such a way that each boy could profit from the knowledge of a skilled mechanic.

This problem was presented to the high school principal and, as a result of several conferences with the principal, a plan was devised to present a good tractor maintenance program.

### Procedure

The following aims and purposes were established:

1. To teach tractor maintenance for farm tractors.
2. To be able to understand the inter-working parts of the tractors.
3. To know the proper procedure for setting up and caring for farm machinery.
4. To learn cooperation between the farmers and the farm shops by learning the problems of the implement dealers.

The local International Harvester Dealer made available one of his skilled mechanics, Mr. Sam Coumbs, for two hours a week for four weeks to give the class instruction in theory and operations of tractor engines.

While the class was receiving instruction regarding the theory of tractor engines, plans were being made with the dealers for International



Instructor Keith Kirkbride and Bud Westerbur, Mechanic, observe while Dave Schorzman checks gears of a large tractor.

Harvester, John Deere, J. I. Case Co., and the Bureau of Reclamation maintenance shop to send class members to the various shops to work with the skilled mechanics.

Upon completion of the classroom instruction, the boys were assigned in groups of two or three to each of the implement dealers. Two hours each day for four days of each week were spent in working closely with the mechanics. Friday of each week was used as a discussion and evaluation period. The program was carried on over a six-weeks period with the boys being rotated to a different shop once during this time.

The objectives of the tractor maintenance program were explained to the dealers and mechanics before the boys were placed in the various shops. Since the mechanics work closely with the boys, it is necessary that they be interested in the program and that they will help the boys. The training period was scheduled during

(Continued on page 162)



Dave Schorzman, student, does the work while the Mechanic supervises the job.



John Deere Mechanic, Mel Boul, demonstrates while students watch. Left—Jim Hirai, Center—Dick Webley, Right—Ed Close.



## Shop Management Aids

### Ideas for improving the program of instruction

ELMER R. SEALOVER, Vo-Ag Instructor,  
Mechanicsburg, Pennsylvania.



The establishment and use of practical school farm shops is a task that many an agriculture teacher has faced in the past decade. Many more of us will be faced with the same problem in the future. Just how practical our shop and programs will be depends on many factors. However, there are many minor ideas we as agriculture teachers can employ that will add greatly to making our programs more meaningful and our tasks more enjoyable.

#### Integrating Shop and Classroom Programs

A closer integration of the shop and classroom programs can be accomplished by incorporating into the teaching program shop jobs directly related to a unit of classroom instruction. An example of this would be the actual teaching of the calibration of a grain drill when you teach the unit on the seeding of small grains. This makes the work more meaningful, establishes continuity and develops greater interest.

#### Shop Project Records

With larger enrollments due to jointures and the increases in population, the teacher oft times does not remember exactly each student's

progress or what he might be doing in the shop. A solution to this has been the use of a three inch by five inch file card for each boy listing the date, shop project, when the project was started and completed, and a final grade upon completion of job or project. It will facilitate operations if these cards are received at the beginning of each shop class.

#### Storing Projects and Clothing

Shop management can be improved with the use of student lockers. Small incomplete projects can be stored as well as the student's shop clothing. The student should be responsible for the safe keeping of its contents. He may prefer keeping it locked.

#### Shop Clothing

We all like to look at anything that has eye-appeal. If all members in the shop class wear the same kind of shop clothing, whether it be aprons or coveralls, it will greatly dress up the appearance of the class and at the same time protect the student's clothing. Mothers usually like this idea.

#### Storing Hand Tools

The storage of hand tools has always been a controversial issue. A

portable tool storage is one method that seems to be quite popular with vocational agriculture teachers. The portable rack can be so constructed that it can be pushed into a common stock storage room and locked. It is also desirable to build some shelving on the rack where small quantities of nails and screws can be kept. A first aid cabinet should also be located on this panel.

#### Safety Coloring

The use of color dynamics on machines and equipment not only changes the tool from traditional gray to colors that harmonize, but also calls attention to the moving parts of the machine and makes them less hazardous. Painting red lines or using red tape which outlines the work areas around the power tools is also a safety feature liked by some agriculture teachers.

#### Clean-Up

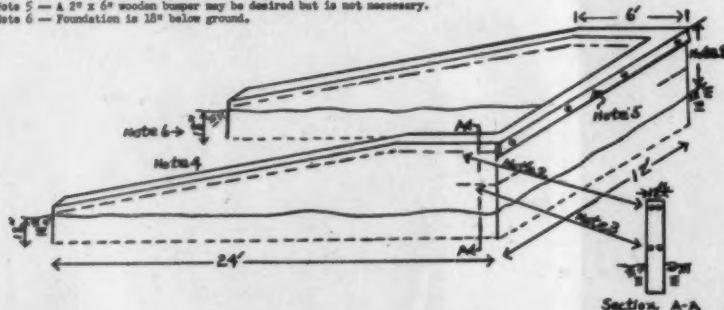
One of the problems in many shops is the clean-up at the end of the class period. One way in which this problem can be solved is to have the clean-up jobs well defined and numbered. At the beginning of the school year put numbers into a hat representing each clean-up job and have each student in the class pull his number. The job which the student picks is his for the year.

In conclusion, you will note that the ideas expressed in this article can all be employed at little expense, but the results will be a more efficient vocational agriculture shop and one in which the students will have pride. It will also tend to up-grade the over-all instructional program. □

#### CONCRETE LOADING RAMP — PLAN A

Prepared by E. V. Walton, Associate Professor  
Department of Agricultural Engineering  
The Pennsylvania State University

- Note 1 — 4" less than empty bed height of trucks to be used works well. (39" suggested)  
Note 2 — 2½" round reinforcing bars, 6" below surface, 3" in from edges. Bend to go around corners. Lap at least 12" where rods length meet.  
Note 3 — 2½" round reinforcing bars. Two 4' lengths at each corner, 2½" from surface.  
Note 4 — Fill with well tamped cinders or gravel.  
Note 5 — A 2" x 6" wooden bumper may be desired but is not necessary.  
Note 6 — Foundation is 18" below ground.



Material Organized in Cooperation with the Department of Agricultural Education for Teachers of Vocational Agriculture  
Frank Anthony and Benton K. Bristol, Subject-Matter Specialists in Farm Mechanics Instruction

A loading ramp is a desirable facility for present day departments of vocational agriculture. This plan shows details for constructing such a ramp.



#### Next Month

Supervision and Administration of the  
Vocational Agriculture Program.



#### Farm Mechanics . . .

(Continued from page 152)

five areas of farm mechanics instruction by the American Society of Agricultural Engineer's committee on Agricultural Teacher Training have proven invaluable directives for content of the all-day program. Similar thought toward developing objectives applicable to young farmer needs would be received with anticipation by teachers and administrators alike. □

# Mathematics in Vocational Agriculture

## Fundamental skills needed in farming - - -

WILLARD M. THOMAS, Vo-Ag Instructor, Taylor, Arkansas.



In every course in high school, the student will find use for knowledge learned in other courses. For example, many principles learned in science courses are quite useful and applicable to agriculture problems. Of all these courses we might discuss which are helpful, none is more important or so indispensable to a successful course of study in agriculture as a thorough understanding and ability in arithmetic. As the modern business of farming becomes more and more complex, a lack of ability to handle figures and solve everyday mathematical problems will be a considerable handicap to the farmer.

In the farm mechanics program, mathematics has a very important place. A great number of problems involving skills in basic mathematics arise in the areas of machinery, carpentry, plumbing, terracing and drainage, and electricity. In these areas, a reasonable mathematical ability can save the farmer a great deal of time, difficulty and often money as well as insure a well planned and accurate job.

Sufficient skill in the fundamental processes of arithmetic to solve the many everyday problems of the farmer today has been found to be very deficient, even in the upper grades of senior high schools. This poor ability in mathematics is not confined to any one school, area or section of the country, but is likely prevalent in most high schools today.

This article is an attempt by a teacher of Vocational Agriculture to point out, in a small way at least, the situation as he has found it and to emphasize the mathematical concepts of learning which students should master in order to get along well in an agriculture course. It is hoped that in some respect these thoughts as set down here may help both the mathematics teacher and any student who might happen to read them to have a slightly better concept of a more meaningful mathematics program and a better understanding of the problems facing the student.

### Need for an Understanding of Basic Arithmetic

A boy beginning his first year study in Vocational Agriculture may want to know why he should need a good understanding of figures and basic arithmetic if he is only going to be a farmer. This knowledge is important to him in the following general ways:

1. In solving everyday problems of a general nature that confront all of us regardless of the nature of our work. These may be problems of the home, personal affairs, buying and selling personal items, financial problems and many others.
2. In solving general farm problems which take on innumerable forms and types.
3. In solving the various problems concerned with the business of farming, buying, selling, trading, improvements, depreciation, borrowing money, gains and losses.
4. To enable him to handle the increasing problems of taxation, especially income taxes, and the various kinds of reports, applications and other types of information required by the government.

### Concepts and Arithmetical Skills Needed

Recognizing, then, the complexity of the modern business of farming, what are some of the most important concepts and arithmetical skills an "Agri. I" student should possess to properly handle the types of problems he will have to solve in his agriculture studies? The following will be those most frequently used in his study and farm work:

1. Concept of areas and the ability to find the area of various figures.
2. Concept of volume and ability to find volumes of the common types of structures and containers.
3. Ability to use and convert the units of measurement, linear, square and cube.
4. Thorough knowledge of fractions and how to handle them.

5. Clear concept of percentage, its use and relation to common fractions.
6. Skill in multiplication and division.

The agriculture student and farmer will encounter many mathematical problems in the following areas, as well as others.

1. Farm Crops
2. Livestock Production
3. Farm Mechanics
4. Farm Economics
5. Soils
6. Fertilizers
7. Farm Buildings
8. Orchards and Gardens
9. Dairying
10. Poultry Production
11. Soil Conservation

In line with those concepts which an agriculture student should have, below are some comments on the mathematical abilities of students as found in teaching.

#### 1. Figuring Areas.

The most simple operations in finding the number of square feet in a rectangle with dimensions given often proves to be beyond the grasp of many boys. Finding the areas of triangles, circles, parallelograms and trapezoids is found to be beyond the comprehension of most.

#### 2. Figuring Volumes.

When any subject under study requires computation of volume, this concept must usually be taught before the work can proceed. This operation often involves the use of fractions and converting units of measurements to other units, especially in figuring cylindrical volumes. Too many high school students cannot perform these functions, even after a review of them.

#### 3. Percentage.

The concept of percentage and how to use it always appears strange and new or difficult to too many boys who will have to use it so much in their everyday life as well as in agriculture studies.

#### 4. Division and Multiplication.

A number of students who have passed Algebra I still have trouble in division, especially in handling the decimal point and dividing a small number by a larger one, which, of course, is still a decimal point trouble. On this point, ideas on the part of the student of what can or cannot be done sometimes approach the fantastic. If one number will not go into another a whole number of times or

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Safety minded teachers know that - - -

## A Clothing Fire Could Happen to You!

C. O. JACOBS, Agricultural Engineering Dept.,  
Kansas State College.



C. O. Jacobs

**I**F you have given thought to the possibility of one of your students becoming seriously burned in a clothing fire, you have asked yourself not only how the disaster might have been prevented but also how it might have been extinguished effectively. What kind of extinguishing method should one use? What instruction should be given students not directly affected? What instructions and first-aid treatment should follow a fire? A thought or two concerning answers to these questions may possibly prevent the loss of life, permanent disfigurement or disability.

### Shop Clothing Should Be Clean

Because of the nature of the work which students undertake in vocational agriculture farm shops, a personal fire (clothing on fire) is always a potential danger. Most clothing fires develop when dirty oil, paint, or fuel-soaked shop wear become ignited by some heat source such as welding and heating operations. The importance of keeping clothing clean for shop work is of utmost significance in preventing this type of fire. Good shop management practices should include close scrutiny of students' shop wear and establishing regular intervals when students take their shop clothing home for laundry. Some teachers have purchased old washers for the purpose of keeping shop clothes laundered. Others have obtained services of the commercial laundry which handles the athletic equipment for the school. If plenty of hot water is available and sufficient care is given to washing clothes in the department-owned washer, a good laundry job can be done. Poorly washed or dirty shop clothing is not complimentary to the student or department. Condition of clothing should be continually surveyed. Baggy,

frayed pant legs and sleeves invite trouble.

### Protective Treatment of Clothing May Help

The practicality of using a fire retardant treatment for clothing of the student in the school farm shop is a debatable subject. When fabrics are kept clean and in good repair, danger of a flash clothing fire is greatly reduced. Certain areas of instruction require, however, that the student not only be protected from flying sparks but also from hot splashes of metal and highly concentrated or reflected heat. For situations such as this, protective treatment of clothing with a fire retardant might be considered. A fair degree of flame-proofness can be obtained by immersing clothing (or any fabric) in a lukewarm solution of one pound borax and 13 ounces of boric acid in two gallons of water. The salts are soluble, therefore the treatment should be repeated after every washing. Few colors are affected by the formula, and the feel or appearance of the clothing is not changed appreciably.

### The Kind of Fire Extinguisher to Use

When we attempt to put out a fire of any origin, we are immediately concerned with extinguishing the flame in the shortest possible time with the least damage to person or property. Authorities recommend that when extinguishing a clothing fire, the first choice of extinguishers be the *fire blanket* especially designed for the purpose. However, a woolen blanket, rug, or overcoat are equally as effective in excluding the oxygen from the fire and smothering it. Water is a good smothering agent for clothing fires but care must be taken in how it is applied. Never use water under pressure. A stream of water directed at a fire could have serious effects on burned skin. If water is used, it can be poured or doused on the victim. Rolling the person in the spilled water is also very effective.

The question concerning the use of such extinguishing agents as CO<sub>2</sub>, dry

chemical, foam, soda acid, and carbon tetrachloride demands attention. The recommendation for these agents is never to use them unless the situation is handled by a person who knows what he is doing. Even then, the damage inflicted by the extinguishing agent could be serious.

Carbon dioxide extinguishes fire by excluding oxygen thereby smothering the fire. If the cloud of inert gas were to envelop the individual in the time required to put out the fire, he would not have oxygen to breathe and would also suffocate. Unless the man using the extinguisher is able to keep the individual's respiratory organs out of the blanket of inert gas, the carbon dioxide should not be used. A considerable volume of carbon dioxide is required to completely extinguish a clothing fire which has gotten well under way, since the glowing and kindling action of the clothing cause ignition as soon as the nozzle is removed. It is doubtful if even a skilled person could avoid enveloping the victim completely with inert gas. There is little danger that a person's skin would be frozen by the carbon dioxide gas if directed a normal distance from the fire source. However, simply holding the nozzle of the wand at one spot and immediately in contact with the skin could cause severe damage.

Both foam and soda acid extinguishers contain sulphuric acid and a reactant to propel the stream out of the hose nozzle. The danger of free acid being carried over in the stream and causing acid burns to skin or loss of eyesight (if not immediately removed or neutralized) would make these types of extinguishers very undesirable.

As in the situations previously mentioned, carbon tetrachloride should not be used against clothing fires unless nothing else is available. It produces not only an inert gas but also a poisonous phosgene gas as a result of its chemical reaction with the fire. In addition, the liquid and vapors are toxic to an individual.

Because of its contents, only the dry chemical is considered safe to use as an extinguisher for personal fires. However, even with this unit care must be exercised that the sodium bicarbonate contents not be directed at the face for fear of endangering the eyes or filling the mouth and nostrils causing possible suffocation.

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## A Clothing Fire - - -

(Continued from page 158)

### Procedure for Controlling a Clothing Fire

Instruction on handling a student or person on fire should not only include information on the type of extinguishing media to use but should also emphasize what the victim should or should not do. Because panic may cause the victim of a clothing fire to run wildly thus fanning the flames, it would be wise to stress the importance of other students tackling, tripping, or in any manner stopping the victim and rolling him in a blanket.

Procedure which should be followed by anyone with a clothing fire is contained in the following reminders:

1. Do not run—running fans the flames. If possible, strip off the article on fire.
2. Wrap yourself in a fire blanket or improvise with a rug, coat or portiere. Wrap it around your neck first, keeping your head out.
3. If there is nothing at hand to wrap yourself in, drop to the floor and roll slowly.
4. If water is available, douse yourself with it and roll in the spilled water on the floor. Run under the shower if there is one close by.
5. Try not to inhale any of the flames. Put your left hand on the right shoulder and the right hand on the left shoulder with your arms against your face for protection.

Other important instructions would be for someone to stand by the phone to call an ambulance or doctor. Someone should notify the superintendent, principal and school nurse. Also of importance would be instruction to keep back from the victim at all times rather than crowding around and excluding air. Parents should be notified at the discretion of the school administration.

### First Aid

The treatment administered to a victim immediately following a serious fire may save his life. First-aid treatment should be that given for shock. Almost any severe injury is accompanied by a greater or lesser degree of shock. The degree of shock is not always in proportion to the extent of

injury. The symptoms of this condition are: a weak and rapid pulse; pallid skin which is cold and clammy and covered with perspiration; rapid and shallow respiration, usually irregular. The patient is usually sufficiently conscious to answer questions in an indifferent way. Place the head low, supply plenty of fresh air and keep the patient warm with blankets and the application of a hot water bottle. *Do not remove the clothing* from the burned skin; avoid breaking

or tearing the skin. Medical treatment should be administered by one competent and responsible such as the school nurse or local physician.

As teachers and workers in vocational agriculture, safety is our business. Safety pays off when we save a life, an eye, a finger, rather than by leaving us with the thought *we* failed by not having at least given instruction on how to prevent the occurrence. Try a clothing fire safety drill with your students. □

## STEPS IN USING FIRE BLANKET



Step 1

Grasp exposed rope handle with one hand—pull and start to pivot. Door of blanket case will be opened to expose fire blanket on roller.



Step 2

Rotate body quickly—at the same time keep blanket close around neck. Continue turning until blanket is released from storage box.



Step 3

Quickly drop to floor and roll slowly (in direction to keep blanket from unwrapping around body).

## Mathematics in - - -

(Continued from page 157)

if they are required to divide a small number by a larger one, they may reply that it will not go or cannot be done. Large, cumbersome fractions may be carried as a remainder in the answer because the student does not know how to handle the decimal to divide the problem out more fully.

These concepts or aspects of arithmetic—areas, volumes, measurement, fractions, percentage and division are discussed here because they are those most often found troublesome for a large number of boys enrolled in Vocational Agriculture. They are also those concepts in which skill in performance will be so necessary to their success and well-being, not only in their course of study in agriculture, but to a great extent in whatever they do after graduation from high school.

Let us more specifically examine how these concepts are so important on the farm.

### I. Concept of Areas and Square Units.

Area of floor space must be figured for such purposes as determining the number of chickens a building can house, the number of cows a dairy barn can handle, the cost of a building, the amount of materials needed to lay or cover a floor and a host of other purposes.

Acres in a field can only be determined by the average farmer by first figuring the area in some unit. Acres or areas of a field are necessary to figure for many purposes such as determining number of trees or plants required, amount of fertilizer or seed needed, time required to cultivate, amount of yield, profit or return per unit expected or obtained.

Land and buildings are the farmer's two major assets; he deals with them every day and they present innumerable problems involving areas and square units of measurement.

#### Problem Examples:

1. Find the number of acres in a field that is one mile long and 88 rods wide.

2. How many apple trees are required to set an acre if the trees are set on a square 35 feet each way?

3. Allowing .75 square feet per broiler, how much would it cost to erect a building to house 10,000 birds at \$2.00 per square foot of floor space?

### II. Concept of Volumes.

The farmer deals with a great num-

ber of things concerning volume. He is usually much better acquainted with volumes in terms of gallons, bushels or some other unit of measure, but too often he does not know how to find the volume of a box or bin or how to convert cubic feet volumes into bushels or gallons. Tables, of course, can be found which give the volumes in cubic feet or inches of the various common units of measure on the farm.

#### Problem Examples.

1. If one bushel of ear corn in husk occupies approximately 3.5 cu. ft., how many bushels will a crib hold which is 15 feet long, 12 feet wide with an 8 foot ceiling?

2. If one sack of cement will make approximately 4 cubic feet of concrete, what would be the approximate cost of the cement required to pour a barn floor 60 feet long, 15 yards wide and 4 inches thick if cement costs \$1.75 per sack?

3. What is the volume of a wagon bed 3 yards long, 3½ feet wide and 12 inches deep?

Concept of dimensions and units of measurement are inseparable from work with areas and volumes as will be noted in above problems. Many students are found who perhaps would tell you that there are 27 cubic feet in one cubic yard because they happen to remember to multiply the three dimensions together. Many of these same students, however, would not be able to explain why or give evidence of a clear concept of cube, linear and square measure. Converting one measurement into another is an ability and concept indispensable for the farmer who is daily dealing with many various units.

### III. Concept of Fractions and Percentage.

Many uses of percentage appear in farming. Ordinary business transactions and actual farm work such as dairying, animal feeding and fertilizing require a knowledge of percentage and fractions.

#### Problem Examples:

1. If a dairyman wishes to mix milk testing 2.3% butterfat with milk testing 5.3% to make a mixture testing 4.0%, how many pounds of each quality milk will be required to give a proper proportion? Of course, this problem can easily be solved by the Pearson Square, found in most any dairy book.

2. How much is a 1514 pound

bale of seed cotton worth if it gins 65.3% seed and lint cotton is worth 31¢ cents per pound?

### IV. Concept of Simple Trigonometric Principles.

The right triangle is a very important figure on the farm, especially in buildings. The rafters of most buildings form the hypotenuse of a right triangle. Quite often, the problem of finding the lengths of various construction members or distances in the field could be simplified if the farmer had an understanding of some simple trigonometric ratios and principles.

#### Problem Examples:

1. A farmer wishes to know the distance across a pond at its widest point. How could he find this distance without actually measuring it?

2. How many squares of metal roofing will be required to cover a barn roof if the barn itself is 80 feet long, 50 feet wide, and the roof is a simple gable type making an angle of 30 degrees with the horizontal?

3. A water supply is located in a pond at the foot of a slope. A farmer wishes to irrigate a truck garden at the top of the slope. If the ground distance from the pond to the truck garden is 300 yards and the slope makes an angle at the top of 20 degrees, what is the vertical distance the water must be lifted?

### Summary

This paper has attempted to point out the fact that most of the concepts herein discussed are those which the ninth grade student should have learned before he enrolls in Vocational Agriculture, trigonometric concepts only excepted. He has already passed courses designed to teach him these various concepts and skills. If the teacher of Vocational Agriculture must use class time to teach these skills before the students can solve problems related to agricultural enterprises, then the agriculture course of study will suffer as far as scope is concerned. However, when it is found that the student does not have this basic ability in arithmetic, then the agriculture instructor should teach him these skills because he could teach him nothing else about agriculture which would be of as much importance to him.

Certainly a review of the fundamental processes of arithmetic is nec-

(Continued on page 161)

For teachers who want new ideas - - -

## Job Control in the Farm Shop

JAMES P. BRESSLER, Vo-Ag Instructor,  
Williamsport, Pennsylvania

If your farm shop falls into the pattern common to most schools, you find it rather trying at times to keep track of all assignments and jobs in which your students are engaged. An accepted concept of farm shop instruction calls for as much individual project work as satisfies the need for skills development on a purposeful activity basis. If properly organized, most farm shop skills can be taught in the form of projects directly useable by the student when completed.

When fifteen or twenty boys are engaged in individual projects in the shop at the same time, a system of job control becomes necessary so that adequate records may be kept and the teacher's memory can quickly review every student's activity. After trying various systems of progress charts and classroom record books, we borrowed an idea from some of the industrial shops in our school that are operated very much on the same basis as ours. This is a job control board that looks and is quite simple, yet does the chore of shop organization better than anything else we have seen.

Briefly, it works like this: The board itself is made of half inch plywood, three feet by five feet. Painted a light gray with black lettering, it looks neat anywhere. A board of this size accomodates sixty

students and can be used from year to year. Every student is assigned a number, probably the same as in your roll book. Small nails below each number hold the cards on which all essential information concerning the student's shop activity are written.

The cards are three inches by five inches in size and record such information as student's name, number, date started, section, shop project, grade for the project, teacher's comments, etc. When a student completes a project and it is inspected and passed by the instructor, the card is filed for record in a card file cabinet. No project is started until such a card is assigned, thus avoiding unapproved or unplanned projects that some boys occasionally drift into.

In time you will have a cumulative record of every student's shop history in a small, compact, safe and readily available source that takes the guesswork and confusion out of farm shop organization. ☐

### Wall Panels - - -

(Continued from page 154)

months use, I noticed that some tool outlines were becoming chipped and scratched from the careless placing of tools against them. Very small screws were placed in the tool outlines and let project about 1/4" at points which prevent the tools from coming in contact with the paint. This completely eliminated the trouble.

### Use Tags for Checking Out Tools

To keep track of tools temporarily out of the shop, I use a tag system. Tags are stamped with the following information: name, date, and name of tool. When a tool is removed from the shop, the information is entered on the tag which is then placed over

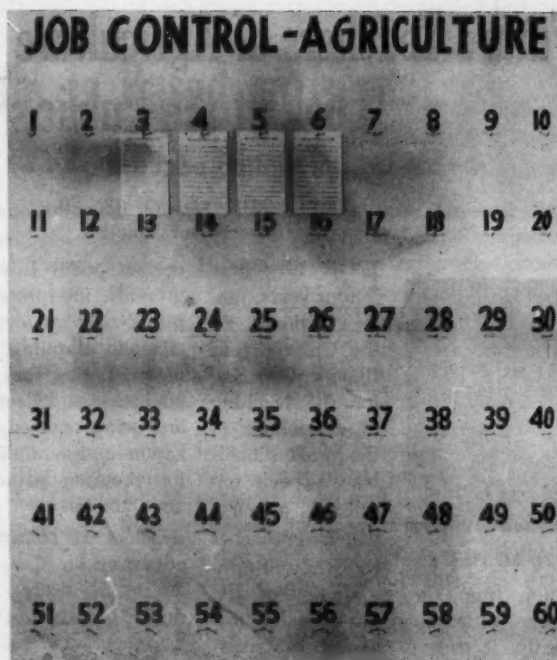
the tool silhouette. At the end of each shop period all tools should be accounted for, or a tag on the tool outline should tell where it is.

Tool panels provide a compact, accessible and attractive arrangement for shop tools. Properly used, they will cut your tool losses to nearly nothing. This results in an increased pride on the part of the pupils for the care and ownership of good tools, and along with this follows a greater interest and better workmanship in farm mechanics. ☐

### Mathematics in - - -

(Continued from page 160)

essary from time to time, but, if a student has once learned a concept, usually only a brief review is sufficient



Job control panel for the farm shop. The cards are hung on small nails below each number.

### JOB ASSIGNMENT CARD

Name \_\_\_\_\_  
Student's No. \_\_\_\_\_  
Sec. \_\_\_\_\_ Date \_\_\_\_\_  
Oper. No. \_\_\_\_\_ Job No. \_\_\_\_\_  
What doing \_\_\_\_\_  
\_\_\_\_\_  
Rating \_\_\_\_\_  
Remarks \_\_\_\_\_  
\_\_\_\_\_  
Instructor \_\_\_\_\_

To be made out neatly and accurately at the beginning of each job.

WILLIAMSPORT TECHNICAL INSTITUTE

to enable him to properly use previously acquired skills in solving the problem at hand. ☐

More than 350,000 farmers lost their farms through distress transfers of one kind or another in 1933, estimates a new study of the Twentieth Century Fund. In the years 1930-1935, it is probable that more than one sixth of all farms in the United States were lost to their owners through various types of forced sales growing out of depression conditions.



# Future Teachers of Agriculture Look at the Public's Problems

in providing education - - -

H. M. HAMLIN, Teacher Education,  
University of Illinois



H. M. Hamlin

FOR the past four years, junior students at the University of Illinois preparing for the teaching of agriculture in the public schools have been enrolled in a course which approaches the study of education from the standpoint of the citizen, rather than the educator. Primarily, it tries to answer the questions: What are the responsibilities of citizens in public education? How can they be discharged? What problems do citizens have in managing public education? What solutions of these problems are being proposed? How satisfactory are the proposed solutions?

The course deals with the nature of American public education, public policy for education, the policy making process, participation in policy making by lay citizens and educators,

current policy issues and their backgrounds; interpreting, executing, and publicizing policy; determining the clientele of public education and its needs; setting the purposes of public education and deciding whether they are being realized; providing organization and administration, arranging for program planning, staff, funds, and facilities.

There is consideration of public education for all age groups. Students are made aware of the agencies of public education other than the public schools and colleges. Local, state, and national programs and relationships are studied.

The basic reference is the instructor's book (Hamlin, *The Public and Its Education*, The Interstate, Danville, Illinois, 1955). Many supplementary references are provided, since one purpose of the course is to acquaint the students with the literature of the schools and education useful to citizens. According to the students, the publications of the National Citizens Council for Better

Schools are among the best of the publications they read. The students are encouraged to read regularly, during the semester, such periodicals as *The Nation's Schools*, *The School Executive*, *The American School Board Journal*, *The National Parent-Teacher*, *Education Digest*, and *Better Schools* to learn how educational issues are currently being discussed.

Nearly all of the students study the school systems in their home communities and report regarding them in term papers. In these studies, they are concerned with the problems which concern citizens, that is, with the problems which have been considered in their classroom work. In addition, the students write two papers dealing with major educational issues confronting citizens, which require considerable use of references. Favorite topics are citizen participation in school affairs, school finance, securing and holding adequate school personnel, and public expectations and evaluations of education.

The students often comment that the course exposes them to a kind of thinking they have not found in their other courses in Education or in any of their other school and college courses. There has been no serious problem of duplication with other courses. The students who do not intend to teach, or who intend to teach briefly, usually believe that the course will be useful to them as lay citizens.

## Tractor Maintenance - - -

(Continued from page 155)

the slack season but at a time when enough work was in the shop to insure keeping the students busy on repairs. The dealers seemed to appreciate having an opportunity to make arrangements in advance to enable them to save up work or to have tractors that could be left in the shop for longer than the usual time.

During the six-weeks period, the instructor was busy checking at each location. The students were allowed to leave school in one car for each place of employment. There seemed to be no temptation to linger or to be truant. The students' interest in their jobs, the initiative of each boy, and complete cooperation was evident throughout the training period.

During the six-weeks training period, the boys gained valuable experience in taking tractors apart, making repairs, and re-assembling the trac-

tors. The boys learned that being able to maintain a tractor in the proper manner will prevent the need for many costly repairs.

### Evaluation of the Program

The first step in evaluating the program was made by the class members in their weekly evaluation periods. During this evaluation period, each boy reviewed what he had done during the past week. A great deal of enthusiasm was shown regarding the chance to put theory into practice in tractor maintenance. The boys were also impressed with the willingness of the mechanics to teach them.

It was felt at the conclusion of the program that each of the aims and purposes had been successfully completed.

The boys were taught tractor maintenance by being able to apply the theory which they learned in the classroom.

They were able to understand the inter-working parts by helping to

take apart and re-assemble the tractors.

In working closely with the mechanics, they learned how proper care of tractors can help to prevent the necessity for costly repairs.

While being a part of the maintenance shop crew, each boy learned some of the problems which the implement dealers have, which gave them a better understanding of the need to cooperate with the implement dealer.

### Concluding Statement

The experiment to improve the tractor maintenance part of the farm mechanics program proved to be very successful. This program will be continued and will be improved on in the future. It is felt that the boys received some very valuable experience. The program also established a good working relationship between the school and the implement dealers which proved to be valuable in the public relations program. □

A teacher finds that a - - -

## Successful Adult Farmer Program Is Based on Needs

JARED Y. TERRY, Vo-Ag Instructor, Dodson, Louisiana

My first attempt at an evening class was as dismal a failure as was ever experienced by any teacher anywhere. After spending a week designing 50 postal cards, inserting announcements in the paper and building it up with all day pupils, I sat back Monday night and waited expectantly for the students to pour in. One hour later, after a thorough discussion of the weather with one farmer and seven "cracker barrel" boys who would attend anything, we called it off and went home.

### Successful Course Based on Needs

When my injured feelings had healed sufficiently a few days later, I tried to figure out what went wrong. The one fact that intrigued me was that one bona fide farmer had attended. I wondered why for awhile and then decided to go see. I located my farmer disgustedly contemplating a broken draw-bar on his tractor. His first comment was, "I could use a good welder for a week." This chance remark by a farmer with a need finally started my thoughts in the right direction. What did the farmer need? Certainly a class in corn production hadn't created any interest as evidenced by my first attempt, even though I felt that I could do a good job teaching it. After many questions, close observations and numerous cups of coffee in the area, I found that nearly all the farmers had equipment and machinery that needed repairs and reconditioning. As I visited each farmer, I ask his opinion about the possibilities of a class in welding at the school shop. Interest was apparent and quickly fol-

lowed by an invitation to attend the first meeting. The results were gratifying. The ten whom I invited showed up at the first class and mentioned several more who had asked about the possibility of attending.

This marked the beginning of the most successful series of meetings I have had. We ran for thirty consecutive periods of three hours each. When one man felt that he had accomplished what he wanted, another was ready to take his place.



Being no great shakes at welding, I invited two professionals in the village to come up and help out. They came willingly and attended every night they were not on the job elsewhere. I believe this is public relations of the best sort and have used carpenters, electricians and welders on several occasions—the feeling being that the more people you have with you the fewer critics you will have later on. A person can usually be sure that people who share his program can be counted upon to defend it.

### Many Factors Effect Planning

After this initial success, which actually began without much prior planning, I reviewed the entire program to see where mistakes had occurred and improvements could be made. I felt reasonably sure that it would be a long time before another such ready-made situation would present itself. It was apparent from the start that all the students weren't interested in the same things, that they couldn't meet on the same nights or even at the same hours. All of these things would have to be considered

in planning for future classes if the program was to serve its purpose. The job of earning a living must come first—evening classes would have to fit in or I would be back to designing postal cards again.

### Conduct of Courses

Programs of instruction are constructed in the normal manner with the exception of provision for an unusual amount of flexibility. Short intensive job units or even operations seemed to give better results than lengthy enterprise coverage. Commercial people who are adept in their field are used to advantage in conducting classes related to their product. We have had very satisfactory results with representatives of feed, veterinary and welding supply companies.

It is not unusual for a group to end a series of meetings on an enterprise other than the one started upon. A study of feeding problems encountered in broiler production might well evolve into a discussion of winter feeding of beef or dairy cattle if the interest of the group tends to move in that direction. Farmers, like any other businessmen, want to talk about what is requiring their attention at the moment. The



guiding concept is always what the farmers need and want. Any other approach only makes the job more difficult.

The problems of scheduling are resolved in the same manner. What does the group want? When can they meet? In a service area composed of several outlying hamlets,

(Continued on page 165)



# Evaluating pupil performance

**If "doing" is the test of "learning to do"! how does a Teacher of Vocational Agriculture proceed to recognize student progress?**

IVAN H. CROUSE, Vo-Ag Instructor, Sussex, New Jersey.

WALLACE H. ELLIOTT, Teacher Education, University of Maine.



Ivan H. Crouse

THE provision "for directed or supervised practice in agriculture, either on a farm provided for by the school or other farm, for at least six months per year" is recognized as a mandatory requirement of the organic act. Regardless of this fact there has been a continuous search during the past 40 years for various promotional and motivating activities to stimulate student interest in farming programs.

Opportunity for profit from farming programs and establishment in farming has always been an important factor, and is today for certain individuals. The granting of extra school credit for satisfactory farming programs was accepted, for a time in some areas, as a happy solution to the problem. However, it served to separate the program of vocational agriculture into two separate parts. The result being that farming programs became more of an appendage, instead of an integral part of vocational agriculture with the farming program as a core of an integrated instructional program.

The Future Farmers of America as an organization has contributed much to promote better farming programs. However, degree advancement, foundation awards, local, county and state fairs do not reach all of the students, and often result in "success leads to success" for a limited number.

Many times the potential opportunities are not realized by the students involved because immediate results are not recognized. The need for immediate recognition is important to the students and parents. The grading system used by the teacher quickly reflects the importance attached to the individual farming programs of his students. The question is, what system shall a teacher use?

\* This article is a follow-up of one written by John A. Snell, entitled "Is 'doing' the test of 'learning to do'?"<sup>1</sup> Therefore, we recommend that the reader refresh his memory by reading that article before proceeding with this one.

<sup>1</sup> *Agricultural Education Magazine*, May, 1956.

<sup>2</sup> A Guide for Instruction in Agriculture Education, Curriculum Bulletin No. 15, State of Minnesota. Department of Education, St. Paul 1, Minnesota.



Wallace H. Elliott

## Minnesota System

A section on "The Grading Method" found in a bulletin<sup>2</sup> from Minnesota attracted our attention in January 1953. To anyone in search of new promotional and motivating activities to encourage more integrated instruction based on farming programs, the system appeared logical. Consequently, the plan was discussed with the teachers at district meetings. As a result of these meetings the teachers were given an opportunity to try "the Minnesota System," as we called it, during the latter part of the school year. A committee of teachers, of which one of the co-authors of this article was chairman, worked on the system during the annual teachers' conference. The experiences of the committee members and the conference reports have resulted in the following statements by the committee chairman, and co-author of this article.

## One Teacher's Experience

When first exposed to the idea of objective grading on the complete vocational program with respect to FFA activities, individual farming programs, classroom and shop activities, I felt it might answer a need in the Vo-Ag classes at Wilton Academy (New Jersey). Having been concerned for some time that a true picture of a student's program was not revealed by the quarterly-rank card plus token credit for the individual farming program, it seemed that such a system as advocated by Minnesota, had some merit.

The first step taken was to gain the

approval of my administrator which in my case was the school principal. His attitude was of the approving yet cautious type, thinking that such a plan would be of value, but feeling that it would have a tendency to eliminate the town student from the vocational agriculture course.

Disregarding the pessimistic attitude about future enrollment, I next presented the idea in brief to the students enrolled in the course. There was little or no dissension from them, as long as they figured on a square deal for all, which is hard to accomplish when it comes to competitive grading. The group selected to work with me on formulating the plan were members of the Agriculture II, III, and IV classes.

As soon as a group was available for work, we cooperatively put into the plan those items which we felt should be emphasized in a vocational agriculture program under the general headings of Classroom Activities, Farming Programs, Farm Mechanics and FFA Activities. Here was the opportunity to adjust weights on the various parts of the program to the extent necessary to spur many on to greater accomplishments in any one of the four areas of instruction.

The weaknesses discovered included the following: lackadaisical attitude toward classroom notebooks, poor planning of farming programs, too little emphasis on improvement projects and skills, poor record keeping by some individuals, plus weak spots in the FFA program. To each of these items we attached heavy values which we hoped would result in individual improvement. To many other activities, which were considered essential to a well-rounded program, values according to their importance were attached. It goes without saying that many new ideas and many changes in values were made before the group and I were satisfied.

The grading system as developed and accepted was put into effect during the 4th ranking period of the 1952-53 school year, strictly on a trial basis. It was realized that it might not be effective and also might be unfair to a few or to many.

Although some difficulty was encountered in getting the students to keep records of their own activities and to present them for the credit which was earned, at the end of the ranking period all but two of the stu-

(Continued on page 165)



**Evaluating - - -**

(Continued from page 164)

dents turned in a list of credits earned and the value of each. To these I added credits for classwork and other activities which they had not, for one reason or another, been able to record.

Each class was graded separately, eliminating the competition between Senior and Sophomore, or Freshman and Junior. A total grade was established and each top grade given a value in line with nearness to perfection of his individual program. All others in the class received a rank in line with the top grade, using to some extent a sliding scale of ranking.

Here was the chance for the first reaction, and I can say that all reaction was favorable from both students and parents. The general feeling was that a boy was now to receive credit for what he was doing, even though much of it was for activities outside of the classroom or shop.

During a summer (1953) FFA meeting, a committee was set up to review the grading system and to make improvements, additions, or deletions for the benefit of a better plan. This committee overhauled the plan completely to overcome weaknesses which were detected in the section on Individual Farming Programs.

I have not included here the activities and credits used in my plan because I think each grading system is an individual school problem. What appears to be of value to my department might have less value to others. Just a few ideas then on what to watch for in the planning of a similar system in your department.

1. Enlist the aid of all students, if possible, in formulating the system. If each pupil feels he has a part, there will be less resistance to the plan.
2. When drawing up the list of activities and credits for each, aim at Chapter or school problems, rather than problems of isolated individuals. Each student will think somewhat of his own strong points when attaching credits.
3. Prepare a simple, readable plan for all levels, and spend some time explaining the method by which you wish to have the credit records kept. Insist on keeping records up to date and

check occasionally for instances of "padding."

4. When arriving at a term rank, disregard the student's name and academic level. Treat each individual as being anonymous. It is not easy to cut down the rank of a good student, but it is his just reward if his program is weak in the other parts, especially his Farming Program.
5. Don't throw this system at new students without a thorough explanation of its value and importance to each of them.

There have been many favorable results from this program, including:

1. Improvement in classroom notebooks
2. Increased use of supplementary reading materials
3. Improved farm enterprise planning
4. Tremendous increase in improvement projects
5. Increase in skill development
6. Increase in number and size of production enterprise projects
7. Decrease in "token" farm placement
8. More effort to increase labor income of projects
9. Additional usage of desirable farm practices
10. Better attendance at special FFA meetings
11. More interest in:
  - a. FFA Contest Participation
  - b. FFA Committee Work
  - c. FFA Recreational Activities
  - d. Earning for the Chapter
  - e. FFA Offices

12. Less difficulties for the instructor  
The over-all picture is favorable; the plan is not perfect but it is worth a try. The only way to find out is work out a plan of your own and use it on a trial basis. □

**Successful Adult - - -**

(Continued from page 163)

schedules must obviously be arranged so as not to conflict with community, church and social activities. These details can best be determined at the first meeting of the group. Here again flexibility is important. The frequency of meetings, the length of periods and starting time should vary with the time of year, seasonal work load and school activities. Oftentimes a class might start out meeting at seven o'clock Monday nights for three hours in the shop and end up meeting two or

three times per week for two hours if conditions warrant it.

Another device that I find tends to maintain attendance levels and create interest is that of dividing the class into interest groups. This makes the instructor's job a little harder and will certainly make careful planning a necessity. This has become standard procedure in our farm shop. Work or instruction in forging, welding and woodworking will be under way in different areas of the shop at the same time. This system has the advantage of appealing to all interests, avoiding congestion in traffic lanes and not causing a bottle-neck at any one machine. Adults are not compelled to attend school and cannot be prevailed upon as all day students often are. Some will attend through friendship with the instructor but most busy farmers will not attend classes unless they see that it is to their advantage to do so.

**Helpful Practices**

The practices and techniques which I have found helpful in evening class work may be summarized as follows:

Establish yourself in your community as a man who is sincerely interested in farming and farmers problems.

Visit among your patrons and study their methods and operations first hand.

Base your program on the current needs—not on what you think you can teach best.

Make your program flexible to meet shifts of interest or emergencies.

Include as many groups and professions as practical in your course of instruction.

Use competent commercial representatives.

Schedule your classes for the convenience of the students.

Group your classes according to interest and facilities.

If these seemingly simple devices can be employed in your community, I believe they will help in dispelling those "evening class blues." □

Spectacular agricultural advances made through science include the development of hybrid corn, which today permits us to grow nearly one third more corn on only 82 per cent of the land needed in the early 1930's, estimates a new report of the Twentieth Century Fund.

## News and Views of the Profession

### George W. Doak



George W. Doak

George W. Doak, supervisor of agricultural education, State Board of Vocational Education, died suddenly of a heart attack Friday morning, September 27, 1957, at Urbana, Illinois, while on his way to a staff meeting.

A former vocational agriculture teacher at Washburn and Metamora high schools, he was widely known and highly respected through Illinois in the vocational agriculture field. Last spring he was honored by the Illinois Association of Vocational Agriculture Teachers for 30 years of service.

He was born in Robinson, Illinois, October 21, 1897, a son of Joseph W. and Clara Darby Doak, and was married to Miss Lois Lusher on July 16, 1929, in Normal, Illinois.

Mr. Doak taught for three years in Minnesota and for 17 years in Washburn High School before coming to Metamora in 1944 where he taught for three years. Since 1947 he had been associated with the State as supervisor in agricultural education.

He was a member of the Westminster Presbyterian Church, Peoria, Illinois; was a graduate of the University of Illinois College of Agriculture, and a member of Alpha Tau Alpha fraternity at the University. He was also a member of the American Legion and the Lions Club of Metamora.

He is survived by his wife, who formerly taught in Washburn and Metamora grade schools; a son, Rev. Charles Doak, of Moscow, Idaho; a daughter, Georgia Mae Doak, a senior at the University of Illinois; a brother, A. G. Doak, of Robinson, Illinois; and a sister, Mrs. E. T. Hope, of Dexter, Missouri.

Funeral services were held at 2 p.m., Monday, September 30, at the Metamora Christian Union Church with Rev. William R. O'Neil of Westminster Presbyterian Church, Peoria, officiating. Interment was at Gridley, Illinois. □

### Fetterolf Retires



H. C. Fetterolf

ment of Public Instruction.

His retirement, sixteen days after his seventieth birthday, closes almost half a century of service to education in Pennsylvania, including 43 years as the State's supervisor of vocational agriculture. During that long career he was accorded many State and National honors, culminating at the close of World War II with the Federal government's choice of him as consultant in reorganizing agriculture and agricultural education in devastated areas of occupied countries overseas.

Mr. Fetterolf was born August 16, 1887, on a farm at Mifflinville, Columbia County, and was educated in the public schools system to which he later dedicated his life's work. He is a graduate of Mifflinville High School, Bloomsburg State Teachers College and Pennsylvania State College, where he received Bachelor of Science and Master of Science degrees and earned a number of points toward his doctorate.

Upon graduation from high school, he attended Bloomsburg Normal School, interrupting his course there to teach a one-room school three miles from Mifflinville for a year. He later returned to his alma mater, Mifflinville High School, as assistant principal, and for three years (1911-14) was principal of Port Allegany High School, McKean County.

His career in agricultural education began in the fall of 1914, when he organized the first vocational school in Pennsylvania. It was at Elders Ridge, Indiana County, and offered three courses—Agriculture, Home Economics and College Preparatory. Mr. Fetterolf was the school's director and, because of the success of his pioneering effort at Elders Ridge, he was invited to enter the Department of Public Instruction the following year to become the State's first supervisor of vocational agriculture and to organize a statewide system of agricultural education.

As part of the program of vocational agriculture, Mr. Fetterolf in 1929 directed the organization of Future Farmers of America chapters in Vo-Ag departments of Pennsylvania high schools. He has

been the FFA's State Adviser ever since. Today Pennsylvania has 293 FFA chapters (one at each of the 293 high school Vo-Ag departments) and their combined membership includes approximately 11,000 of the 12,000 Vo-Ag pupils enrolled in Pennsylvania. The instructional force for these 12,000 pupils has operated under Mr. Fetterolf's supervision and contains 350 teachers of agriculture and 30 area supervisors.

Following World War II, Mr. Fetterolf organized Young Farmers' classes offering agriculture education to persons beyond the high school age. These classes contained many returned GIs enrolled under the veterans' training program, but between 30 and 40 per cent of the enrollment consisted of former Vo-Ag students who were not veterans but wished to continue instruction they had found helpful in their high school days. Today 80 of these Young Farmers' classes continue to operate in Pennsylvania with enrollment between 2,500 and 3,000.

Because of his wide experience in problems of agriculture and agricultural education, Mr. Fetterolf has been called to serve in many capacities not directly associated with the classroom. For 14 years he was a member of the Pennsylvania Farm Show Commission, for 17 years a member of the State Committee of the Farm Security Administration (predecessor of the Farm and Home Administration), for five years a member of the State Rural Electrification Committee, and for three years a member of the National Advisory Council of the Future Farmers of America.

For many years he has been a prominent member of the American Vocational Association of 35,000 members. He was the AVA vice president, representing Agricultural Education, for three years, and was the national president of AVA in 1950-51. He served as chairman of the AVA committee on Institutional On-Farm Training for Veterans, was a member of the AVA committee on Universal Military Training, the AVA committee to administer the Sears-Roebuck Agricultural Foundation Fund for Vocational Agriculture, and for 12 years a member of the national committee on judging contests of the AVA.

He also is a member of the National Education Association, the Pennsylvania State Educational Association, and the Pennsylvania Vocational Association. He was elected to Kappa Phi Kappa, honorary educational fraternity, and Alpha Tau Alpha, honorary agricultural educational fraternity. He is a member of the Masonic fraternity, the Consistory, and the Shrine of North America. For 36 years he has been a member of the Camp Hill Presbyterian Church on whose board of trustees he served for six years. He also was a member of the Board of Governors of the West Shore Country Club for nine years.

(Continued on page 167)

**Fetterolf Retires - - -**

(Continued from page 166)

Uncle Sam, in both World Wars, enlisted his knowledge of agricultural education and farming in Pennsylvania. In World War I, he assisted in organizing the Pennsylvania Division of the United States Boys' Working Reserve, which trained 5,000 city lads and put them on farms to help supply farm labor, living either with a farm family or in labor camps from which they went to work by the day as needed.

In World War II, the Federal Government named him State Director of the Food Production War Training Program and, in the five years he served in that capacity, this program gave special instruction to 17,000 Pennsylvania farmers—one of every ten farmers in the State. For farm machinery repairs alone, 528 evening classes were organized to help keep in operation precious farm equipment, irreplaceable because of wartime scarcities. Several hundred classes in food production also were organized, to increase production from the same acreage. During the war, Mr. Fetterolf also served as the Department of Public Instruction's representative on the State Victory Garden Committee and was a member of the Sears-Roebuck Foundation's committee to stimulate food production.

Probably one of the most outstanding achievements in vocational education was the successful administration of the "institution on-farm training" conducted in Pennsylvania under the Veterans' Training Act. Mr. Fetterolf was instrumental in initiating this program which resulted in the rehabilitation and training of approximately 10,000 G.I.'s who had entered the occupation of farming. The pattern set up in Pennsylvania for this program was adopted in 41 other states.

On October 12, 1952, the American Forestry Association presented Mr. Fetterolf with a bronze plaque and life membership in the Association for his outstanding state program in re-forestation and conservation. Each year the American Forestry Association selects some person engaged in the field of education to receive this honor.

Familiar with his meritorious record in these wartime assignments, Uncle Sam called upon him again in the reconstruction period following the end of hostilities. Representing agricultural education, he was a member of the American Education Mission to Korea in 1948 where, under the auspices of the U. S. Department of the Army, the Mission conducted two eight-week institutes of teacher training for 625 Korean teachers. In 1949, the Department of the Army sent him to Germany as consultant in agricultural education.

These assignments to the Far East and to Central Europe gave Mr. Fetterolf

**BOOK REVIEWS****MACHINES FOR POWER FARMING**

by Archie A. Stone and Harold E. Gulvin, pp. 616, illustrated, published by John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Price \$5.95.

This book was written for students of vocational agriculture as a guide to selecting, using, and maintaining farm machines. It is unique in treating power (the tractor) and the machine as a single unit in actual operation. The close and necessary relationship of the machine and its power is emphasized throughout the book. It contains shop work exercises, suggested activities, and review questions at the end of most chapters.

The book is presented in eight major parts: (1) Power for Production, (2) Primary Tillage, (3) Seedbed Refining, (4) Fertilizer Application, (5) Planting and Seeding, (6) Weed, Insect, and Disease Control, (7) Harvesting, and (8) Management. Chapters are included on the major machines within each of the eight parts of the book. The book is so arranged that any chapter on a specific machine may be abstracted and studied individually as a unit.

**Evans Joins Tennessee Staff**

Clarence Evans

For the past five years he has been teacher of vocational agriculture at Everett High School, Maryville, Tennessee.

Mr. Evans was raised on a farm in Oklahoma. He received the B.S. degree in agriculture from the University of Tennessee in 1952 and the M.S. degree in 1955. His thesis dealt with course building in vocational agriculture.

He has been active in promoting future farmer activities. He is chairman of the agricultural section of the East Tennessee Education Association. He is a member of Phi Kappa Phi, an honor society.

many experiences of unusual interest. He has been invited to return both to Korea and to Germany but at present is disinclined to accept either invitation. His expectation, instead, is to retire to the 160-acre farm at Mifflinville which he has owned and managed for the past 41 years.

Mr. Clarence R. Evans has been appointed assistant professor of agricultural education at the University of Tennessee. He will be responsible primarily for student teaching activities of the department.

For the past five years he has been

The book is recommended for departments of vocational agriculture as a text or reference for the area of farm power and machinery.

Mr. Stone is Emeritus Head, Department of Agricultural Engineering, State University of New York. Mr. Gulvin is Head, Farm Supply Research, Eastern States Farmers Exchange, and was formerly a teacher of vocational agriculture and head of the Department of Mechanized Agriculture, University of Rhode Island.

—GBJ

**INTRODUCTION TO AGRONOMY** by R. S. Dunham, pp. 324, illustrated, published by The Dryden Press, 31 West 54th Street, New York 19, N. Y. Price \$4.50.

This book was written to be used as a basic text in Agronomy. It is presented in four parts: (1) The Agronomists and His Crops, (2) The Agronomists and His Soils, (3) Production Factors, and (4) Production Hazards. Chapters are included on Crop Classification, Forage Crops, Cereal Crops, Soils, Seeds and Seedlings, Crop Rotations, Water, Light and Temperature, Diseases, Insects, and Weeds. Cultural practices have been omitted.

Teachers of Agriculture shall find the book useful as a reference. Professor Dunham is located at the University of Montana.

—GBJ

**Cardozier to Tennessee**

V. R. Cardozier

For the past five years, he has been specialist in vocational agriculture for the National Cotton Council of America.

Dr. Cardozier was reared on a farm in Louisiana and taught in that state. He holds B.S. and M.S. degrees from Louisiana State University and the Ph.D. degree from Ohio State University. His dissertation dealt with in-service teacher education.

His writings have appeared in numerous professional journals and farm magazines. He is the author of *Growing Cotton*, a book written especially for use in vocational agriculture classes, and *Public Relations for Vocational Agriculture*. He is a member of Phi Delta Kappa, Gamma Sigma Delta, Alpha Gamma Rho, and is listed in *Who's Who in American Education*.



## Stories In Pictures



Members of the Adult Farmer class at Shawnee High School discuss the principles of an electric pump with a student teacher from the Ohio State University, during one of their winter meetings. (Photo by Ralph J. Woodin)



Lights in the hen house—Johnny Eubanks, Bristol FFA Chapter in Florida, former winner of the Southern Region Farm Electrification Award, shown installing a time clock to turn on and off the lights in the hen house.



Twenty-two advisory areas were represented at a Farm Structures Program held at University Park, Pennsylvania, July 9 and 10. The program consisted of two, one-day workshops which presented basic farm building information, teaching aids, and a special building plan prepared by The American Zinc Institute. The workshop on July 9 was primarily for resident classes of agricultural education. The one on July 10 was for county representatives of vocational agriculture (who will hold follow-up workshops for their local areas.)



Freshmen of the Bridgewater, South Dakota, Vo-Ag Dept. showing rat bait boxes made as a part of their grain sanitation programs. (Photo by G. Schaaf, Instructor)



The change from hand picking to machine picking of cotton requires skilled operators of highly mechanized farm equipment in Mississippi. (Mississippi Vo-Ag Education Department Photo)



Gilbert Motz, senior in the Lone Tree, Iowa, Vo-Ag Dept., sitting on part of the Vo-Ag Dept. Farm Mechanics exhibit held on his farm. (Photo by E. Hornbuckle, Instructor)

